

- NOTES:
1. LENGTH OF RESTRAINT SHOWN IS IN FEET.
 2. WHERE LINES CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.
 3. U1 AND U2 = UNINTERRUPTED STRAIGHT RUNS OF PIPE IN EACH DIRECTION.
 4. U1 = THE SMALLER OF U1 OR U2
 5. L = MINIMUM RESTRAINED LENGTH ALONG THE BRANCH.
 6. DEPTH OF BURY 1'3"

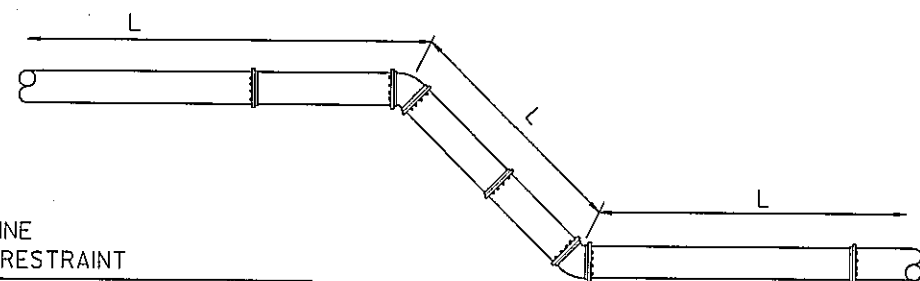
| PVC LINE | | | | | |
|----------|-----|-------|--------|---------|---------|
| TEE | U1 | 0'-5' | 6'-10' | 11'-15' | 16'-20' |
| 10X10 | 121 | 111 | 102 | 93 | |
| 12X12 | 170 | 148 | 126 | 104 | |

MINIMUM RESTRAINED LENGTH (L)

| DUCTILE IRON LINE | | | | | |
|-------------------|----|-------|--------|---------|---------|
| TEE | U1 | 0'-5' | 6'-10' | 11'-15' | 16'-20' |
| 10X10 | 69 | 61 | 53 | 45 | |
| 12X12 | 93 | 81 | 69 | 57 | |

TEE RESTRAINT

SCALE: NONE



| PVC LINE UPPER BEND RESTRAINT | | | | | |
|---|-----------|---------|---------|-----|-----|
| WITH A 6' - 8' LOWSIDE DEPTH | PIPE DIA. | 11 1/2' | 22 1/2' | 45' | 90' |
| | 4" | 6 | 12 | 26 | * |
| | 6" | 9 | 17 | 36 | * |
| | 10" | 14 | 28 | 57 | * |
| WITH A 15' - 20' LOWSIDE DEPTH | 4" | 6 | 12 | 26 | * |
| | 6" | 9 | 17 | 36 | * |
| | 10" | 14 | 28 | 57 | * |
| | 12" | 16 | 33 | 68 | * |

| DUCTILE IRON LINE UPPER BEND RESTRAINT | | | | | |
|---|-----------|---------|---------|-----|-----|
| WITH A 6' - 8' LOWSIDE DEPTH | PIPE DIA. | 11 1/2' | 22 1/2' | 45' | 90' |
| | 4" | 4 | 9 | 17 | * |
| | 6" | 6 | 11 | 23 | * |
| | 10" | 9 | 18 | 37 | * |
| WITH A 15' - 20' LOWSIDE DEPTH | 4" | 4 | 8 | 17 | * |
| | 6" | 6 | 11 | 23 | * |
| | 10" | 9 | 18 | 37 | * |
| | 12" | 10 | 21 | 43 | * |

| PVC LINE LOWER BEND RESTRAINT | | | | | |
|---|-----------|---------|---------|-----|-----|
| WITH A 6' - 8' LOWSIDE DEPTH | PIPE DIA. | 11 1/2' | 22 1/2' | 45' | 90' |
| | 4" | 2 | 4 | 9 | * |
| | 6" | 3 | 6 | 13 | * |
| | 10" | 5 | 10 | 20 | * |
| WITH A 15' - 20' LOWSIDE DEPTH | 4" | 1 | 2 | 4 | * |
| | 6" | 1 | 3 | 6 | * |
| | 10" | 2 | 5 | 10 | * |
| | 12" | 3 | 6 | 12 | * |

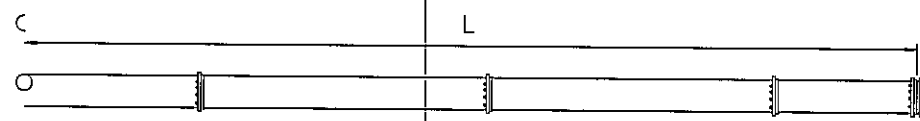
| DUCTILE IRON LINE LOWER BEND RESTRAINT | | | | | |
|---|-----------|---------|---------|-----|-----|
| WITH A 6' - 8' LOWSIDE DEPTH | PIPE DIA. | 11 1/2' | 22 1/2' | 45' | 90' |
| | 4" | 2 | 3 | 7 | * |
| | 6" | 2 | 5 | 10 | * |
| | 10" | 4 | 8 | 16 | * |
| WITH A 15' - 20' LOWSIDE DEPTH | 4" | 1 | 2 | 3 | * |
| | 6" | 1 | 2 | 5 | * |
| | 10" | 2 | 4 | 8 | * |
| | 12" | 2 | 4 | 9 | * |

MINIMUM RESTRAINED LENGTH (L)

- NOTES:
1. LENGTH OF RESTRAINT SHOWN IS IN FEET.
 2. WHERE LINES CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.
 3. VERTICAL OFFSETS REQUIRE RESTRAINT OF ALL JOINTS WITHIN THE CALCULATED LENGTH (L) ON BOTH SIDES OF THE UPPER AND LOWER FITTINGS. WHEN RESTRAINED LENGTHS OVERLAP ON THE DIAGONAL PIPE, ALL JOINTS BETWEEN THE FITTINGS SHOULD BE RESTRAINED.
 4. * - NOT RECOMMENDED

VERTICAL BEND RESTRAINT

SCALE: NONE

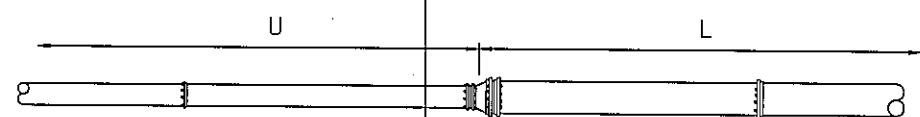


| DUCTILE IRON LINE | | PVC LINE | |
|-------------------|-----|-----------|-----|
| PIPE DIA. | L | PIPE DIA. | L |
| 6 | 41 | 6 | 76 |
| 8 | 55 | 8 | 101 |
| 10 | 76 | 10 | 144 |
| 12 | 104 | 12 | 196 |

- NOTES:
1. LENGTH OF RESTRAINT SHOWN IS IN FEET.
 2. WHERE LINES CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.
 3. DEAD ENDS REQUIRE RESTRAINT OF ALL JOINTS WITHIN THE CALCULATED LENGTH (L) EXTENDING FROM THE CAP.

DEAD END RESTRAINT

SCALE: NONE

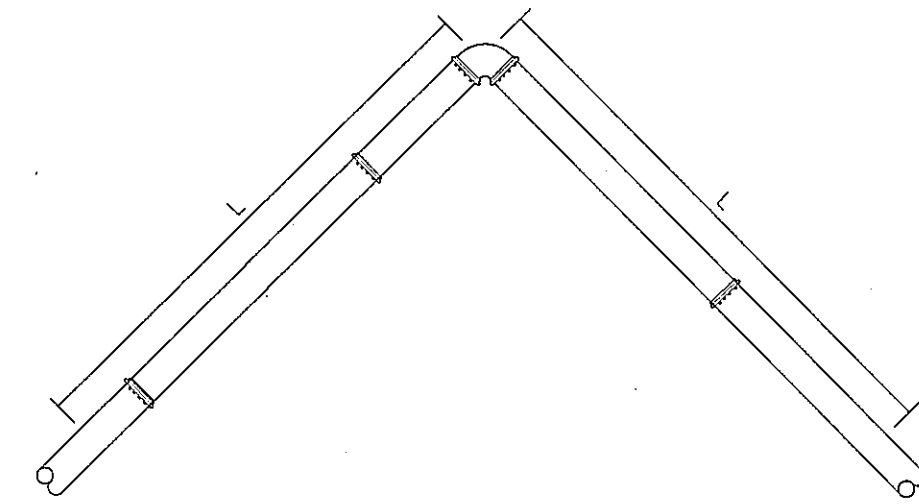


| PVC LINE | | | DUCTILE IRON LINE | | |
|----------|-----|-----|-------------------|----|----|
| REDUCER | L | U | REDUCER | L | U |
| 8X6 | 69 | 118 | 8X6 | 39 | 64 |
| 10X6 | 86 | 148 | 10X6 | 48 | 80 |
| 16X12 | 104 | 178 | 16X12 | 77 | 96 |

- NOTES:
1. LENGTH OF RESTRAINT 1" MINIMUM RESTRAINED LENGTH IS SHOWN IN FEET.
 2. U = MINIMUM UNINTERRUPTED STRAIGHT RUN OF PIPE ON SMALL SIDE OF REDUCER.
 3. WHERE LINES CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.
 4. WHERE MINIMUM "U" IS NOT MET, PIPE ON LARGE SIDE OF REDUCER SHALL BE RESTRAINED FOR A MINIMUM OF 1' FEET.

REDUCER RESTRAINT

SCALE: NONE



| PVC LINE | | | | | |
|--------------------------------------|-----------|---------|---------|-----|-----|
| USING A 4 FT. DEPTH OF BURY | PIPE DIA. | 11 1/2' | 22 1/2' | 45' | 90' |
| | 4" | 3 | 6 | 12 | 28 |
| | 6" | 4 | 8 | 16 | 40 |
| | 10" | 6 | 13 | 26 | 63 |
| | 12" | 7 | 15 | 31 | 75 |

| DUCTILE IRON LINE | | | | | |
|--------------------------------------|-----------|---------|---------|-----|-----|
| USING A 4 FT. DEPTH OF BURY | PIPE DIA. | 11 1/2' | 22 1/2' | 45' | 90' |
| | 4" | 2 | 4 | 9 | 22 |
| | 6" | 3 | 6 | 13 | 32 |
| | 10" | 5 | 10 | 21 | 50 |
| | 12" | 6 | 12 | 25 | 60 |

MINIMUM RESTRAINED LENGTH (L)

- NOTES:
1. LENGTH OF RESTRAINT SHOWN IS IN FEET.
 2. HORIZONTAL BENDS REQUIRE RESTRAINT OF ALL JOINTS WITHIN THE CALCULATED LENGTH (L) ON BOTH SIDES OF THE FITTING.
 3. WHERE LINES CONSIST OF BOTH DUCTILE IRON AND PVC WITHIN THE LIMITS OF REQUIRED RESTRAINT, LIMITS FOR PVC SHALL APPLY.

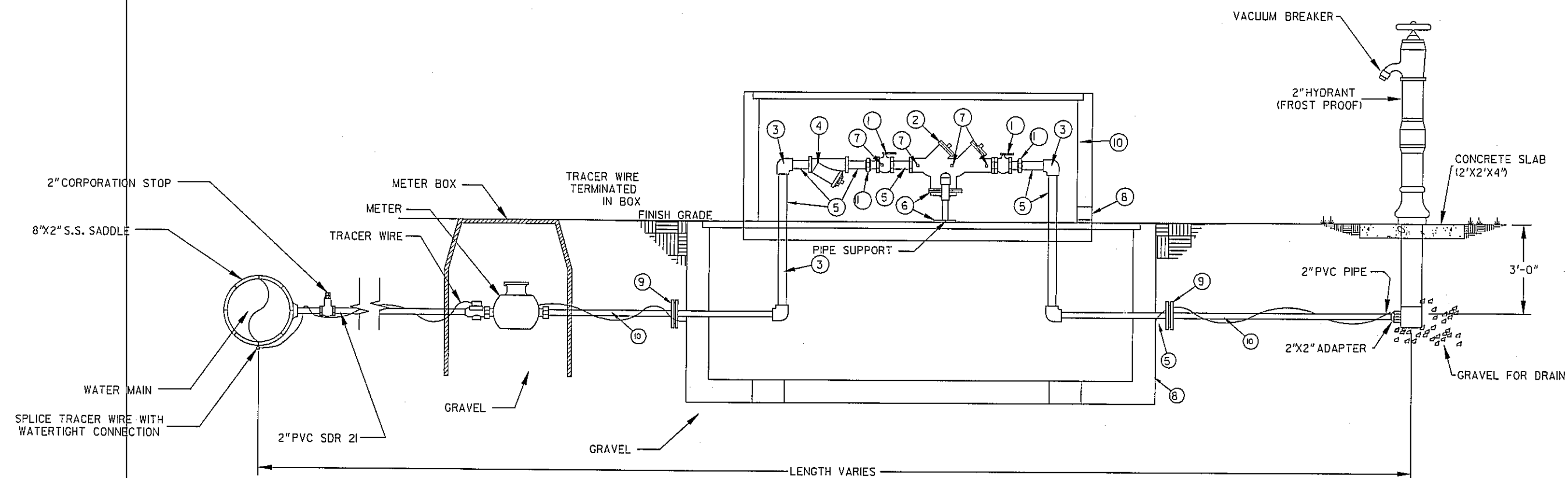
HORIZONTAL BEND RESTRAINT

SCALE: NONE

| MATERIALS | | |
|-----------|-------|---|
| ITEM | QUAN. | DESCRIPTION |
| 1 | 1 | DOUBLE DETECTOR CHECK VALVE ASSEMBLY |
| 2 | 1 | REDUCED PRESSURE ZONE DEVICE |
| 3 | 4 | TEST COCKS |
| 4 | 2 | UNION FITTING |
| 5 | | BRASS OR SCH 80 NIPPLES CUT TO LENGTH |
| 6 | 2 | 2"x2" WEEP HOLE |
| 7 | 2 | PIPE SUPPORT (MIN. 6") |
| 8 | | ENCLOSURE PER CITY SPECS FOR TYP. METER PIT |
| 9 | 2 | BRASS COUPLINGS THREADED OR FLANGED |
| 10 | | SCH 80 PVC |

NOTES:

1. FOR FINAL APPROVAL, ASSEMBLY MUST BE CENTERED IN ENCLOSURE IF APPLICABLE. UNDER NO CONDITION WILL ANY CONNECTION BE ALLOWED BETWEEN THE SERVICE METER AND A BACKFLOW PREVENTER USED FOR THE SYSTEM CONTAINMENT. BACKFLOW PREVENTER SHALL ALWAYS BE INSTALLED DOWNSTREAM OF METER.
2. IF A PRESSURE MONITOR IS TO BE INSTALLED, ADD A TEE, VALVE, FITTINGS, AND MOUNT ON SUPPLY SIDE PRIOR TO BACKFLOW PREVENTER. UNDER NO CIRCUMSTANCES SHALL TEST PORTS BE MODIFIED OR UTILIZED FOR THIS OR OTHER APPLICATION, OTHER THAN BACKFLOW DEVICE TESTING.
3. COST FOR CORPORATION STOP, BFP, 2" WATER SERVICE LINE AND 2" VALVES TO BE INCLUDED IN THE LUMP SUM COST FOR 2" DIA. WATER SERVICE LINE.



PUMP STATION SITE
WATER SERVICE SYSTEM

SCALE: NONE

REVISION DATES

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| STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION |
| OFFICE: SPECIAL CONSTRUCTION DETAIL |
| REST AREA # 87 & 88 PUMP STATION DETAILS |
| DRAWING No. 38-07 |